UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/446,738	02/18/2000	YUVAL COHEN	B-3833PCT617	2829

7590 08/15/2003

RICHARD P BERG
LADAS & PARRY
5670 WILSHIRE BOULEVARD
SUITE 2100
LOS ANGELES, CA 90036-5679

EXAMINER	
GRAHAM, ANDREW R	
ART UNIT	PAPER NUMBER
2697	

DATE MAILED: 08/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/446,738	Applicant(s) COHEN ET AL.	
	Examiner Andrew Graham	Art Unit 2697	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 February 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5,7,8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements (IDS) were filed after the mailing date of the application on February 19, 2000. The submissions are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements have been considered by the examiner.

Specification

2. The disclosure is objected to because of the following informalities: the margins of page 5 are improper. Please submit a duplicate copy of this page of the specification.

Drawings

3. The drawings are objected to because they fail to meet the following requirement(s) of CFR § 1.84.

- *§ 1.84 (l) Character of lines, numbers, and letters:*

Every line, number, and letter must be durable, clean, black (except for color drawings), sufficiently dense and dark, and uniformly thick and well-defined. The weight of all lines and letters must be heavy enough to permit adequate reproduction. The shadings, several of the sound pattern drawings, and the dash speakers in the drawings are not adequately defined for reproduction.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 9-13** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "said at least one first transducer" in the first and second lines of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "said at least one second transducer" in the first and second lines of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "said at least two ultrasound receivers" in the second and third lines of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "information received along each one of said at least two channels of each said at least two receivers is supplied to each of two different ears of the user along a separate one of said human audible channels". This limitation is considered

vague and indefinite because of the phrase "along a separate one of said human audible channels". From the claim language, it is unclear whether this is intended to mean that the information is provided along the two different audible channels to each ear in the claim, or another, new audible channel distinct from those along which the ultrasound transducers convert ultrasound signals. Also, the use of the word "information" suggests that data, as opposed to sound, is presented in the audible channels, but the data is presented to the users ears, which suggests that it is sound. The best interpretation of this claim language is that the information comprises sound signals, and that the information is separately provided in each, previously discussed human audible channels. The rejections below are made based on this interpretation. The intended meanings of the claim should be established by appropriately amending or otherwise editing the claim language.

Claim 13 is objected to because of its dependence upon Claim 12.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1-2, 5-12, 14-15, and 17** are rejected under 35 U.S.C. 102 (b) as being anticipated by Neumann et al (DE 2652101 A1). Hereafter "Neumann et al" will simply be referred to as "Neumann".

Neumann discloses a device for the wireless transmission of sound to a pair of headphones that includes the ability of adjustably locating a sound source at a perceived imaginary position. The sound is transmitted in a wireless manner to the headphones by being modulated onto a carrier (page 4, lines 1-4). This reads on "a wireless headphone assembly". As can be seen in Diagram 1, the headphones (15,16) include ultrasound reception elements (6,7) (page 5, lines 5-10). As is also shown in Diagram 1, the transmitter is modulated with a monophonic signal (page 5, lines 25-34) Thus, the reception of the signal by reception elements (6,7) reads on "at least one ultrasound receiver for receiving at least one ultrasound signal along at least one ultrasound channel". The ultrasound signal is processed by the demodulators (10,11) and then passed through

amplifiers (13,14) before being received by the headphone systems (page 5, lines 13-22). The headphone systems (15,16) read on "at least one transducer for converting each of said at least one ultrasound signal along said at least one ultrasound channel to a human audible signal".

Regarding **Claim 2**, Neumann also discloses a stereo sound embodiment of the wireless audio system. This embodiment is shown in Diagram 2 with two transmitters (page 6, lines 1-4). Neumann discusses the use of two carrier frequency values for being used with the left and right stereo channels in order that the overall modulated signals do not overlap after being emitted (page 6, lines 9-11). The reception wiring of the headphone unit is mentioned as being able to process the signals from the emitters on both signal courses, so that each ear can perceive the phase difference that is required to provide imaginary direction to the sound (page 6, lines 11-15). With this processing ability, the two receivers of the system of Neumann read on "said at least one ultrasound receiver comprises two ultrasound receivers, each of which receives an ultrasound signal along two channels".

Regarding **Claim 5**, the headphone part of the system of Neumann includes reception elements (6,7) for providing a signal to demodulators (10,11). These reception elements read on "at least one first transducer which converts at least one ultrasound signal to at least one modulated electrical signal". The headphone elements (15,16) receive the demodulated signal from demodulators (10,11) and

amplifiers (12,13) (page 5, lines 16-22). These demodulators and headphone systems, which present the electrical signal in a perceivable manner to the human ear comprise what Neumann terms a "frequency transformer", and read on "at least one second transducer which converts said at least one modulated electrical signal to a human audible signal".

Regarding **Claim 6**, Neumann notes that the wiring for each of the headphone reception elements needs to be arranged so that each of the signals emitted in the stereo sound embodiment can be processed by the respective receivers (page 6, lines 11-13). The requirement for this is so that each ear can obtain the phase differences in the signals so that an imaginary direction can be derived by the ears (page 6, lines 13-15). This capability for the reception elements (6,7) reads on "said at least one transducer comprises at least one multi-channel transducer".

Regarding **Claim 7**, the reception system of Neumann includes blocks (8,9) wherein the signals are amplified and cleared from interfering signals whose frequencies lie outside the frequency range to be transmitted (page 5, lines 13-16). The latter of these two processes, the clearing of invalid frequency signals from a set range, reads on "at least one band pass filter associated with each ultrasound channel".

Regarding **Claim 8**, the reception system of Neumann also includes demodulators (10,11) for the received signals, which reads on

"at least one demodulator associated with each ultrasound channel" (page 5, lines 16-17).

Regarding **Claim 9**, the system of Neumann includes a frequency transformer comprising reception elements, a demodulator, and a headphone system that are positioned in front of a system user's ears and adapt the ultrasound signal into a form that can be heard by the human ear (page 4, lines 22-29). The frequency transformer system reads on "at least one first transducer is operative to convert said at least one ultrasound signal to at least one modulated electrical signal". As the transformers are positioned in front of each of a user's ears, the combination and arrangement of these systems reads on "at least two first transducers, each arranged to be located adjacent a different ear of the user".

Regarding **Claim 10**, as mentioned above the system of Neumann includes a frequency transformer comprising reception elements, a demodulator, and a headphone system that are positioned in front of a system user's ears and adapt the ultrasound signal into a form that can be heard by the human ear (page 4, lines 22-29). The headphone systems, as positioned in each transformer unit in front of each ear, read on "said at least second transducer comprises at least two second transducers, each providing a human audible output to a different ear of a user".

Regarding **Claim 11**, please refer to the like teachings of Claim 10, noting that the signal perceived by the user through the headphone elements (15,16) is initially received by the frequency transformer

system by the ultrasonic reception elements (page 4, lines 22-29 and page 5, lines 13-22). This reads on "a human audible signal derived from ultrasound signals received at each of said two said at least two ultrasound receivers is supplied to each ear of a user".

Regarding **Claim 12**, as discussed in regards to Claim 2, the stereo reception embodiment of Neumann includes reception elements (6,7) that are arranged to received the two stereo signals emitted at different carrier frequencies from two transmitters (page 6, lines 9-15). This reads on "said at least two ultrasound receivers each receive ultrasound signals along at least two ultrasonic channels". The two headphone systems at each ear, as discussed in regards to Claim 5, provide an audible signal from the demodulated ultrasound signal (page 4, lines 22-29). In the stereo embodiment of the system, each ear system receives the two modulated channels (page 6, lines 9-15). The overall processing of the headphone systems read on "said at least two second transducers convert ultrasound signals along at least two human audible channels to human audible signals". The signal provided to each of the ears of the user in the stereo embodiment of the system of Neumann represents a sound signal from a sound source (page 3, lines 10-13). As there exists a phase difference between the left and right stereo signals that are perceived by a user, the audible signal perceived by the user, which represents an intelligent sound source, reads on "information received along each one of said at least

two channels of each of said at least two receivers is supplied two each of two different ears of the user along a separate one of said human audible channels". As noted above, the claim language of Claim 12 is rejected under U.S.C. 112 for being vague and indefinite. The rejection of the claim listed here reflects the best, valid interpretation of the limitations presented in the claim language.

Regarding **Claim 14**, please refer to the like teachings of Claim 1 regarding the "headphone system", "headphone assembly", "at least one ultrasound receiver" and "at least one transducer", noting that the sounds reproduced by the system are representative of recorded sound events from sound sources, which reads on the claim language of "a simulated multi-source environment" (page 3, lines 10-13). The transmitting stage of the system includes a two stereo sound entrances (21,22) which connect input signals to modulators (19,20) that modulate the sound signals with a carrier frequency from a joint carrier frequency generator (4) (page 6, lines 1-7). Collectively, these signal inputs (21,22) and modulators (19,20) and carrier frequency generator (4) read on "at least one processor receiving a multi-source signal and modulating an ultrasound carrier along a plurality of channels". The output of this system are emitted by two transmitters, which reads on "at least one transmitter for transmitting said modulated ultrasound carrier to the at least one headphone assembly along said plurality of channels". As an option for the stereo embodiment, Neumann also notes that the different

stereo channels can be modulated with different carrier frequencies so that their outputs do not overlap (page 6, lines 9-11).

Regarding **Claim 15**, the perceived phase difference between the received channel signals in each ear enables the user to hear an imaginary sound source direction (page 6, lines 13-15). This reads on the system being "operative to cause a listener using said headphone assembly to experience psycho-acoustic effects that said listener would experience if the multi-source signal were transmitted in free space as audible sound waves from suitably located sound sources". The parallel between the system and normal, spatially positioned speakers is discussed on page 4, lines 18-30.

Regarding **Claim 17**, please refer the like teachings of Claim 14.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 3 and 16** are rejected under 35 U.S.C. 103 (a) as being unpatentable over Neumann et al (DE 2652101) as detailed above, and in further view of Scofield (USPN 5459790).

As detailed above, Neumann discloses a device for the wireless transmission of sound to a pair of headphones that includes the ability of adjustably locating a sound source at a perceived imaginary position. As can be seen in Figure 2, the stereo system of Neumann emits the two left and right input signals in their entirety from signal entrances (21,22) to the reception elements (6,7). This reads on "said two ultrasound receivers, called a right receiver and a left receiver, provide ultrasound signals to right and left ears of a user".

Neumann does not specify:

- that the transmission system receives and provides a front left and right rear signal to the left ear of a user from a left receiver
- that the transmission system receives and provides a front right and left rear signal to the right ear of a user from a right receiver

Scofield discloses a system for a head mounted surround sound virtual positioning system that receives input signals from a Dolby® decoder. Figure 5 illustrates a support structure for providing two localized speakers (58,60) to the ears of a user (col. 6, lines 42-53). Figure 14 illustrates a general scheme for how the signals from the surround sound decoder (204) are condensed into two signals for near spatially positioned headset speakers (58,60) (col. 11, lines 20-32). Figure 15 details this condensation of signals to a greater extent (col. 11, lines 59-60). As can be seen in this diagram, for

the two headset speakers of Scofield, the right rear (RR), left rear (LR), right front (RF), and left front (LF) surround signals are passed through binaural channel processors (230,232,234,236) and combined to produce the outputs for the headset speakers (58,60) (col. 11, lines 60-67 and col. 12, lines 1-4). In view of the transmission scheme of Neumann, this combination of spatial signals reads on "the right receiver provides a front right signal" and " a rear left signal to the left ear" and "the left receiver provides a front left signal" and "a right rear signal to the right ear".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the spatial signal combining means of Scofield in the wireless system of Neumann. The motivation behind such a modification would have been that the filters and combined spatial signals would have provided a more spatially based signal to the output transducers of Neumann than the simple stereo embodiment illustrated by Neumann, while still using the same number of outputs. The addition of the spatial processing and combining circuitry would have also made the wireless ultrasound system of Neumann compatible with a Dolby decoder, which would have increased the range of audio sources that would have been applicable to the composite system.

Regarding **Claim 16**, please refer to the like teachings of Claims 3 and 14.

7. **Claim 4** is rejected under U.S.C. 103 (a) as being unpatentable over Neumann et al (DE 2652101) as detailed above, and in further view of Fidi (USPN 4068093).

As detailed above, Neumann discloses a device for the wireless transmission of sound to a pair of headphones that includes the ability of adjustably locating a sound source at a perceived imaginary position. As can be seen in Figure 2, the system of Neumann illustrates at most two ultrasound receiving elements for the headphone reception part of the system. These receiving elements are spatially positioned and the differences in the reception of the transmitters in at each receiver are used to ascertain the imaginary sound direction (page 4, lines 11-19).

Neumann does not disclose:

- the use of four ultrasound receivers, each of which receives an ultrasound signal along one ultrasound channel

Fidi discloses the use of infrared and ultrasound transmitters to impart a spatial effect upon two channels of sound to derive a third and fourth channel of sound. Specifically, as can be seen in Figure 5, the left and right front signals are emitted by separate infrared transmitters (2), and the left and right surround or rear signals are emitted by a pair of ultrasound transmitters (3). The respective receivers (7,8) obtain the emitted signals and the derived delay in the signals is based on the difference of the transmission speeds of the mediums (col. 1, lines 31-47). Fidi also notes that a delay device may be added into the transmission path to further

improve the derived sound impression (col. 2, lines 47-55). In view of the spatially located receiver delay method of Neumann, the teachings of emitting four different channels with four different transmitters reads on "said at least one ultrasound receiver comprises four ultrasound receivers, each of which receives an ultrasound signal along one ultrasound channel".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the multi-channel transmission scheme of Fidi into the wireless transmission system of Neumann. The motivated combination would have involved the use of the delay scheme of Neumann and the four channel emissions scheme of Fidi. The motivation behind such a modification would have been that adding more channels to the system of Neumann would have improved the quality of the adjustment of the delay processing because each input signal would have been based on four channels of audio instead of two. The use of all ultrasound emitters, because of the spatial positioning of the receivers, as taught by Neumann, would have meant that no new channel specific delay elements would have been need for the system, as disclosed as desirable by Fidi. Four ultrasound emitters would have enabled the same general ultrasound carrier frequency generator to be used for each of the channels. The addition of front and rear, and left and right designed channels would have also made the combined system more compatible with a more extensive degree of audio sources.

8. **Claims 13 and 18-21** are rejected under U.S.C. 103 (a) as being unpatentable over Neumann et al (DE 2652101) as detailed above, and in further view of Inanaga et al (EP 438 281). Hereafter "Inanaga et al" will simply be referred to as "Inanaga".

As detailed above, Neumann discloses a device for the wireless transmission of sound to a pair of headphones that includes the ability of adjustably locating a sound source at a perceived imaginary position. In the system of Neumann, the phase difference between left and right signals is obtained only through the reception of both signals from the stereo signal transmitters (page 6, lines 11-15).

Neumann et al does not specify:

- that the headphone receiving assembly includes delay lines to simulate the acoustic delay between received signals

Inanaga discloses a method for the imaginary placement of an audio signal source that includes the sending of an ultrasonic reference signal. The audio processing circuits of Inanaga include delay circuits (26,27) for variably adjusting the delay of the cross talk components of input channel signals based on the size of the head of the user (col. 8, lines 31-37). These circuits read on "delay lines operative to simulate the acoustic delay occurring between the arrival of sound from a signal source at the two ears of the user".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to include the delay lines of Inanaga in the headphone signal processing circuitry of Neumann. The

motivation behind such a modification would have been that the delay and corresponding circuitry of Inanaga would have improved the characteristics of the imaginary delay affected upon the stereo sound signals in the system of Neumann. Such a modification would have been particularly desirable because the delay adjustments were not only variable per user, but variable according to a specific parameter of a user.

Regarding **Claim 18**, the positioning scheme of Inanaga includes the emission of an ultrasonic reference signal which is received by receivers on a user headset, which reads on "sending an ultrasound reference signal to a headphone assembly worn by a user having two ears". The circuit of Inanaga includes a transmission characteristic processing circuit (23) for providing the right and left channel acoustic signals (S_R,S_L) to a user's ears(col. 7, lines 12-21). This processing and signal transfer reads on "said headphone assembly audibly providing at least one audio signal to each of the ears". The detection times of the reference signal from each left and right receiver (5L,5R) are provided to a time difference detection circuit (19) and a distance calculating circuit (18), the output of the latter of which is involved with the ability to calculate the size of a user's head (col. 5, lines 54-58 and col. 6, lines 1-38). This reads on "processing arrival times of said ultrasound reference signal at each said ear, so as to measure a phase difference of said signal as perceived by one ear in contrast to the other ear and to measure a distance between the two ears of the user". It is particularly noted

that the distance between the user's ears is considered indirectly determined because the three of the five sides of the adjoined left half and right half triangles are known, as well as two of the angles corresponding to two of these known sides, as is shown in Figure 3. The exact value of the ear-to-ear distance can be shown by inserting these known values into a trigonometric equality of the Law of Sines. Again, it is this indirect, but equivalent calculation that reads on the "measure a distance between the two ears of the user". The time difference and distance detections are provided to an angle calculating circuit (20), the output of which is used in adjusting signal processing units (21L, 21R) which receive adjust versions of the left and right input signals as respective inputs. This reads on "modulating at least two audio signals, at least one for each ear, in accordance with said phase difference". Again, the outputs of these processing units (21L,21R) are provided to be reproduced by the headphones, which reads on "sending said at least two audio signals via said headphone assembly to each of the ears" (col. 8, lines 49-56).

Regarding **Claim 19**, signals in the system of Neumann are modulated and transmitted with an ultrasound carrier frequency (page 6, lines 1-11). The reference signal of Inanaga also transmitted in an ultrasonic manner (col. 5, lines 6-11). Collectively, this reads on "sending said at least two audio signals and said ultrasound reference signal via ultrasound carrier".

Regarding **Claim 20**, the transmission of audio signals to a headset via a wireless medium is well known in the art, along with the benefits of such a transmission. Wired electrical communications of audio signals are also known to be the most common method of signal transmission in the art. One of the input sources of Inanaga is listed as being wireless, while the wire or wireless connection of others are not detailed (col. 7, lines 6-11). The signals in the system that are intended to be wireless are specifically detailed with the transmission and reception components for doing so (col. 5, lines 6-11). The system of Inanaga includes left and right amplifiers (28L,28R) that emit left and right ear acoustic signals to the respective headphones, such emission being implicitly direct (col. 8, lines 49-56). Amplifiers are also well known in the art to provide the properly leveled driving signals for speakers. Additionally, Neumann explicitly details wiring being involved with the reception of the transmitted signal (page 6, lines 11-13). Between the well known art, the teachings of Inanaga, and the teaching of Neumann, this reads on "sending said at least two audio signals comprises sending the signals to said headphone assembly by wired communication".

Regarding **Claim 21**, as noted in regards to Claim 19, the audio signals in the system of Inanaga are transmitted through modulation with ultrasonic carrier waves, which reads on "send the signals to said headphone assembly by wired communication".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is (703) 308-6729. The examiner can normally be reached on Monday-Friday (7:30-4:30), excluding alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen, can be reached at (703) 305-4386. The fax number for the organization where this application or proceeding is assigned is 703-872-9314 for regular communications, and 703-872-9315 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Andrew Graham
Examiner
A.U. 2697

AG

ag
August 11, 2003

FORESTER W. ISEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600